

Flight Scientist Report

Wednesday 02/03/2021 ACTIVATE RF44

Flight Type: Statistical Survey - Clouds

Flight Route: KLFI ZAGIV KMQI OXANA WILYY OXANA KMQI ZAGIV KLFI

Special Notes: First joint flight of winter 2021 campaign. Today is special as we are trying to capture the transition from stratocumulus clouds to more open cell structures to the southern end of our track. Avoided some BCT legs on Falcon

King Air

Mike Wusk report: First two-ship science flight for the UC-12 in support of ACTIVATE Campaign #3. Planned route was KLFI-MQI-OXANA_WILYY and back. The weather had intermediate clouds but was clear at FL290 and a predominant wind from the northwest at 40 knots. Data was collected at 29000 ft MSL for most of the flight. Track (moved 30nm east) and altitude (up to FL290) was slightly altered during mission due to Naval carrier ops in the area. Dropsondes were deployed. Flight had good temporal coincidence with HU25. All objectives were achieved and no system discrepancies were noted, pending post-flight data analysis. Aircraft had no major issues. Aux Fuel gages failed to read in flight, Mx will troubleshoot. Should not affect flight schedule.

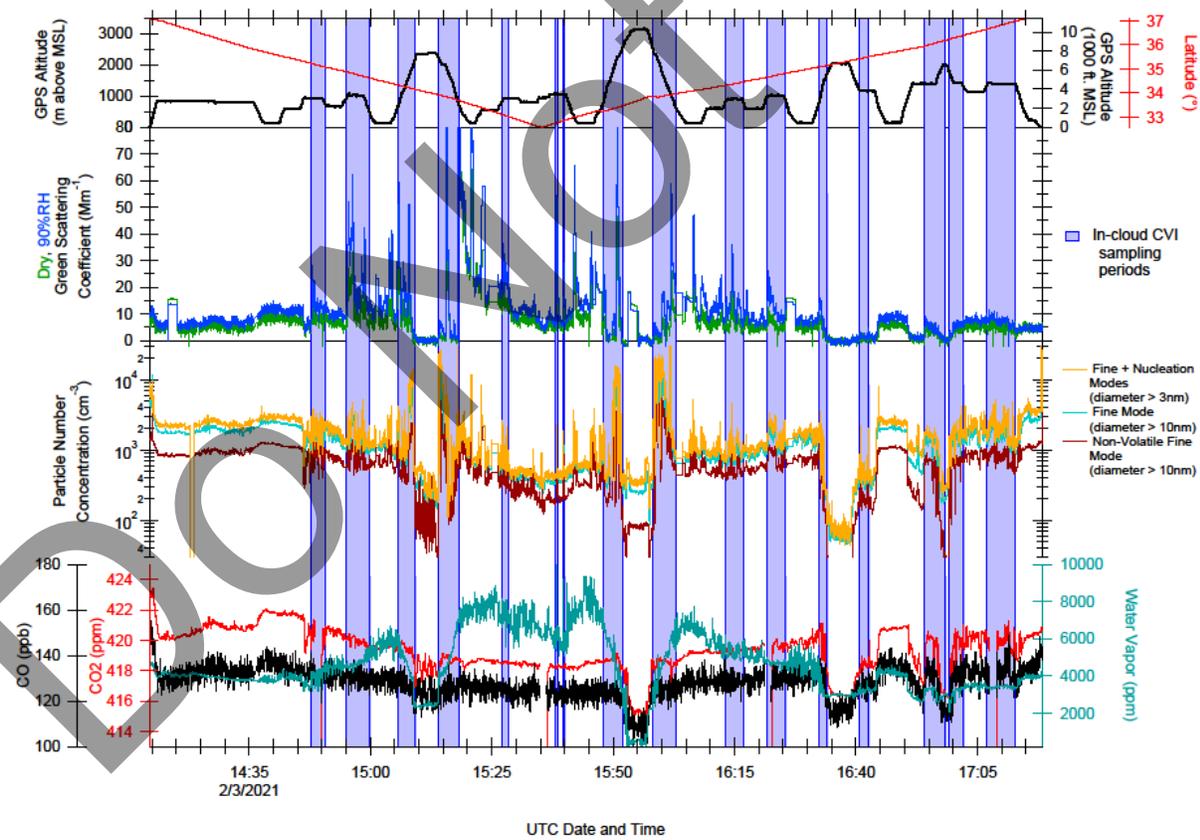
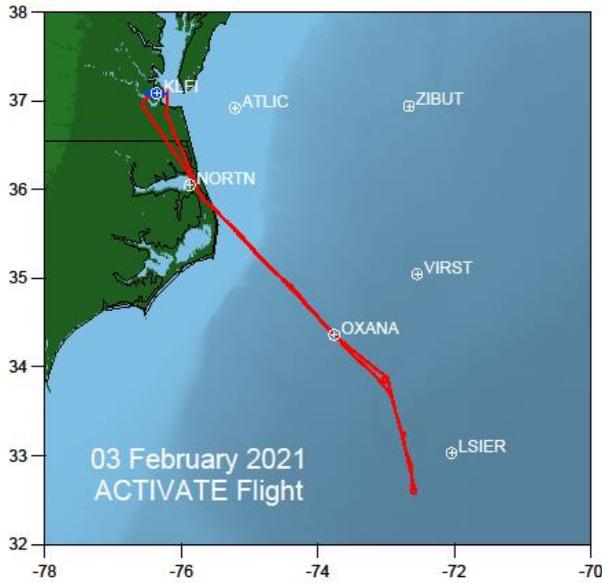
Taylor Shingler scientist report: The UC12 flew out AR8 with an intended leg between OXANA and WILYY. On this OXANA-WILYY leg, there was a conflict with our flight pattern and a military ALTRV. This leg was pushed about 30 nmi to the East to deconflict. HSRL2, RSP, and AVAPS were all operational. The nadir camera was inop for this flight and will be looked at before the next flight. Five dropsondes were deployed: 1) between the coast and OXANA, 2) between OXANA and WILYY (+30 mi east), 3) 30mi East of WILYY, 4) OXANA, and 5) near the coast in AR8. There was a fairly solid cloud deck until reaching near the turnaround point where the cloud deck was broken. Seemed to be a tenuous aerosol layer above 6 km; low AOT but depolarizing. Preliminary analysis indicates the source of dust is not African but rather more likely North American or even Asian.

Falcon

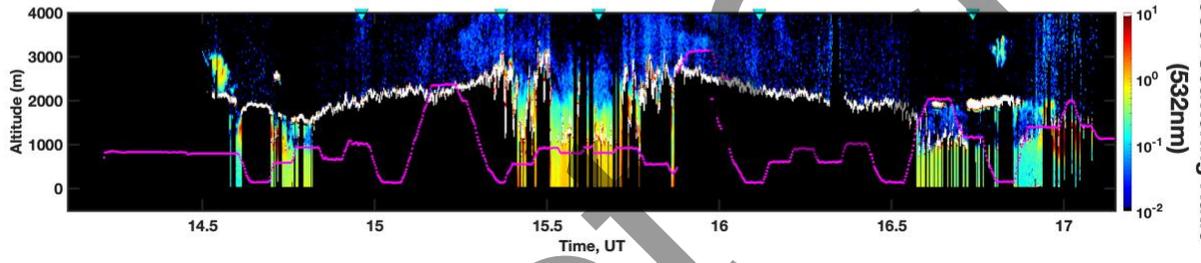
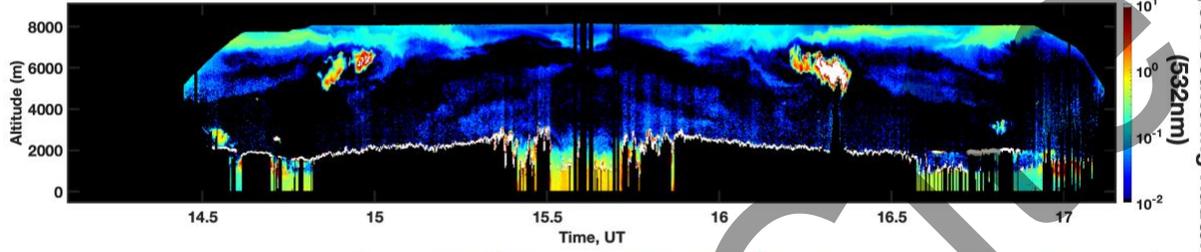
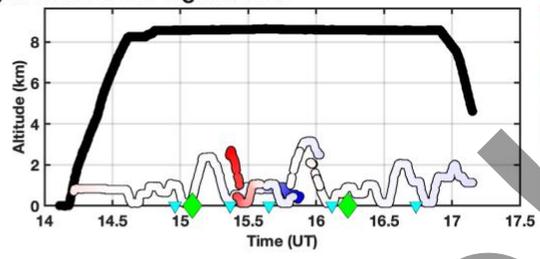
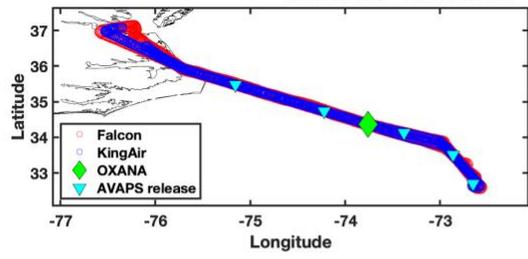
Taylor Thorsen flight report: We flew a 3.1 yesterday. Our route was amended to ZAGIV MQI OXANA NETSS N 32 28 W 072 31 and back. Above about 5,000' the instruments would begin to accrete ice but luckily the total air temp down low would remove the ice.

- 3 full cloudy modules
- Clouds formed close to shore, thickening rapidly into a well-defined layer. Mixed phase precipitation was quite extensive by the time we were on the 2nd or 3rd leg which might limit the usability of sub cloud aerosol in places.
- Icing in cloud was a factor for the BCT legs which were shortened accordingly.
- Cloud water was collected near cloud base and below during precipitation

- As forecast, a transition from overcast to broken Cu was observed near the SE turnpoint



20210203 - ACTIVATE - KingAir and Falcon flight tracks



Time Difference (UC12-HU25) (min)

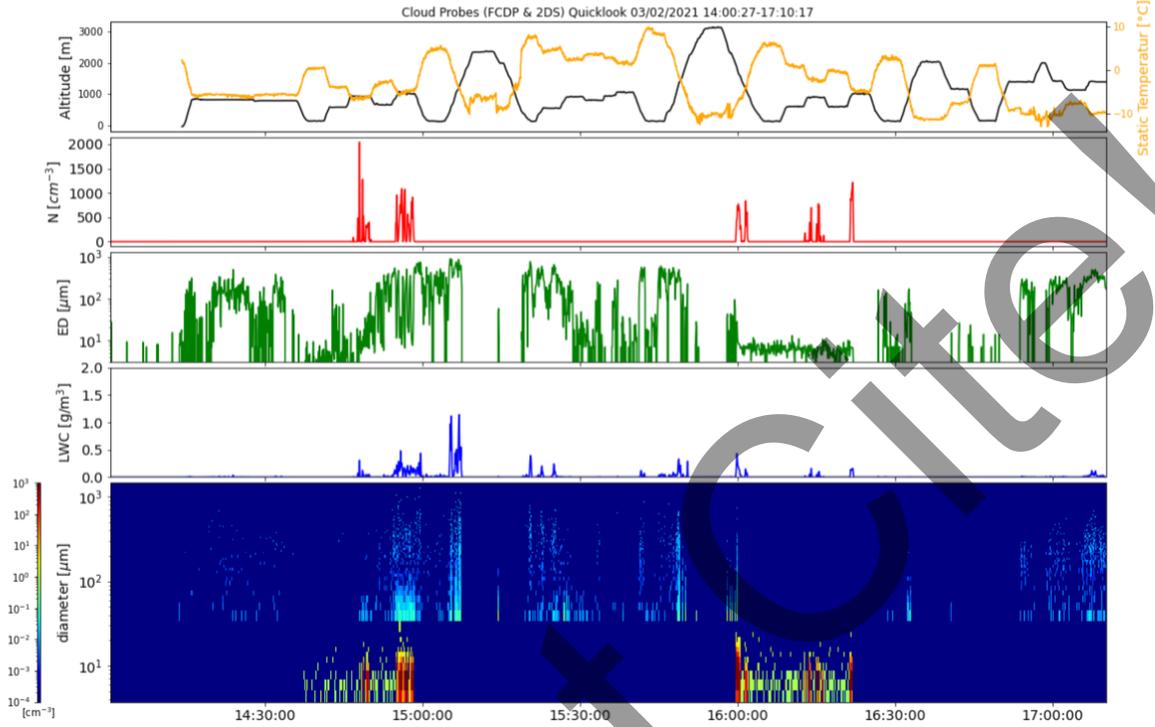
Aerosol Scattering Ratio (532nm)

DO NOT

Quicklook ACTIVATE Cloud Probes (FCDP & 2DS) Quicklook

preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie



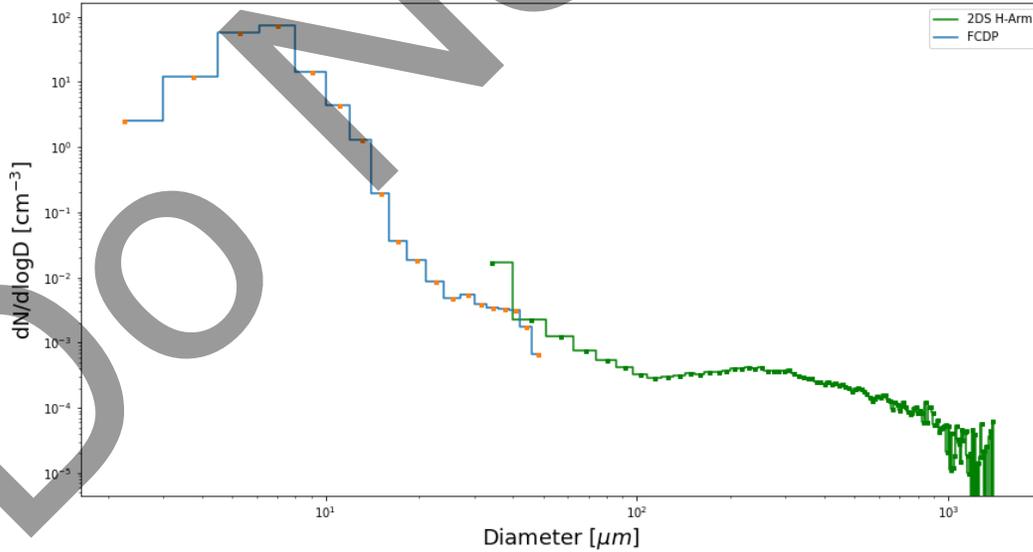
PSD ACTIVATE

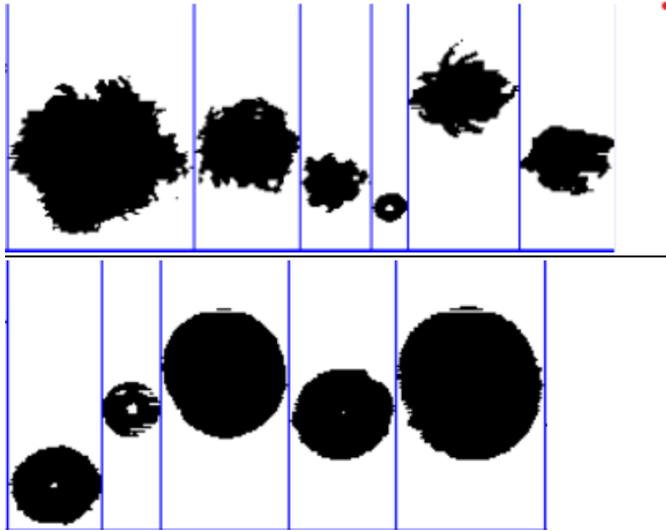
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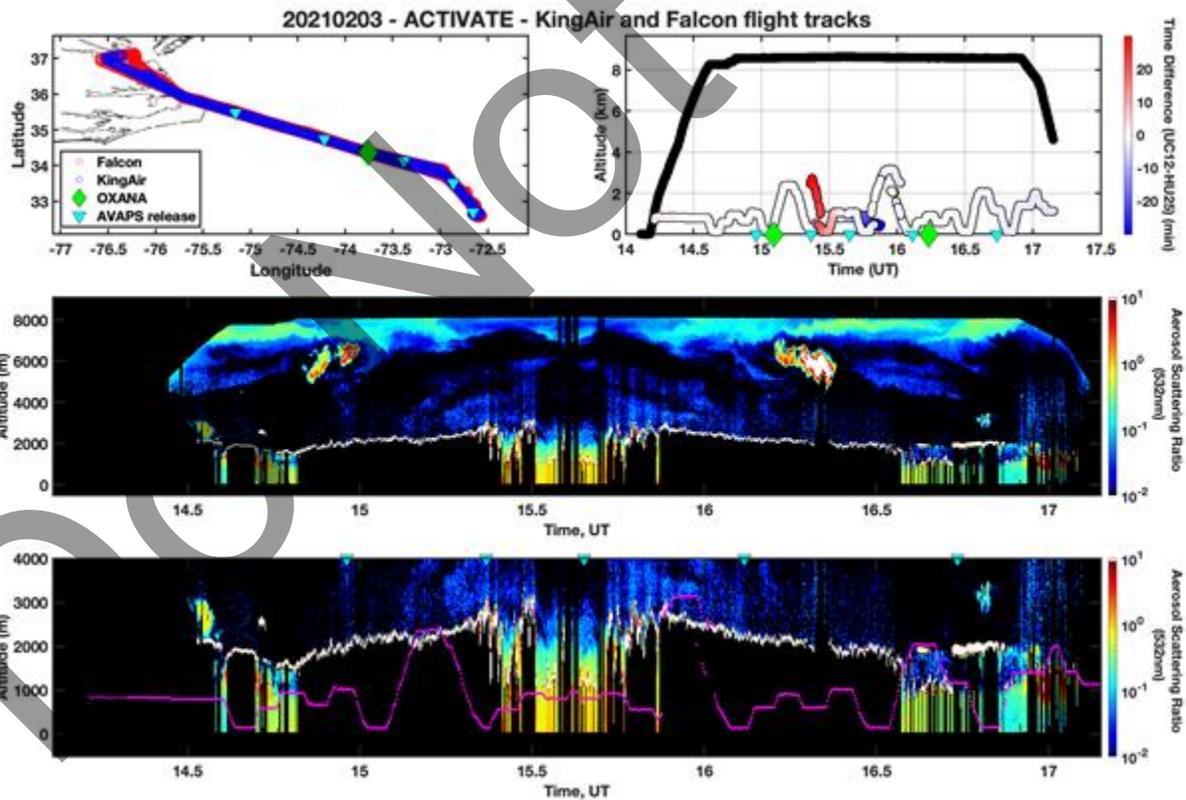
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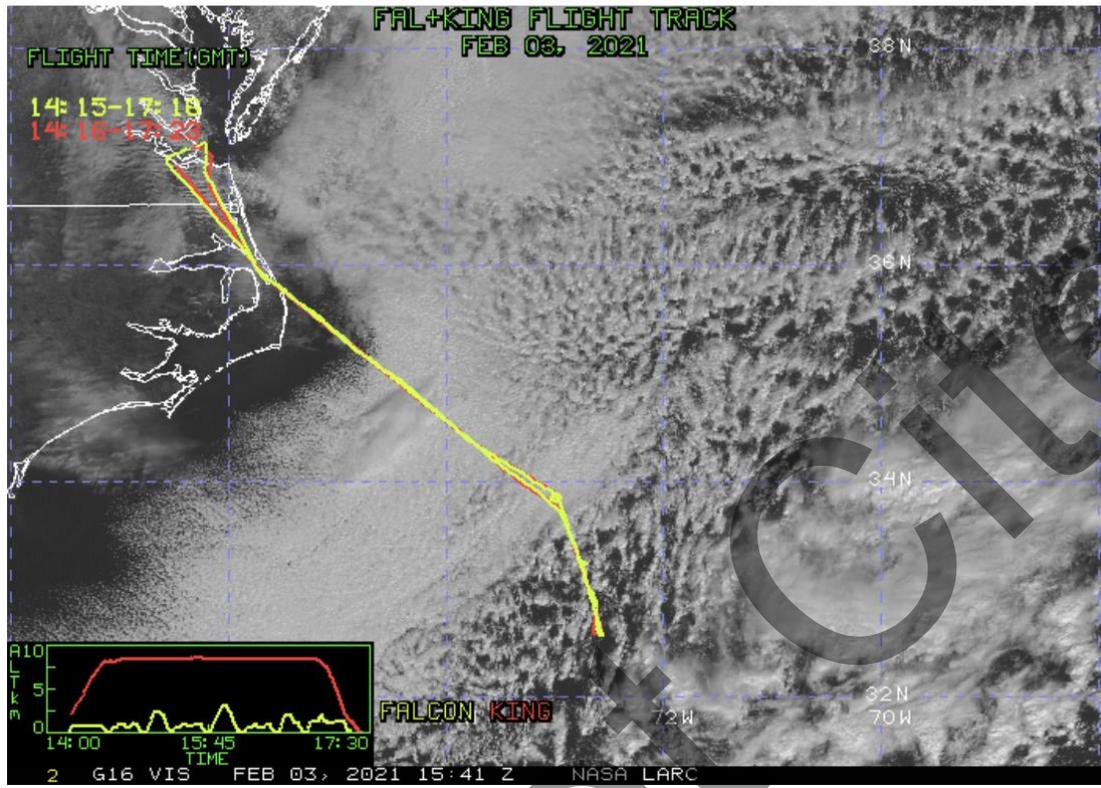


Liquid and Mixed-Phase Clouds.
 Pure Liquid Precip near turning point.
 Mixed-Phase Clouds had high portion of rimed particles.

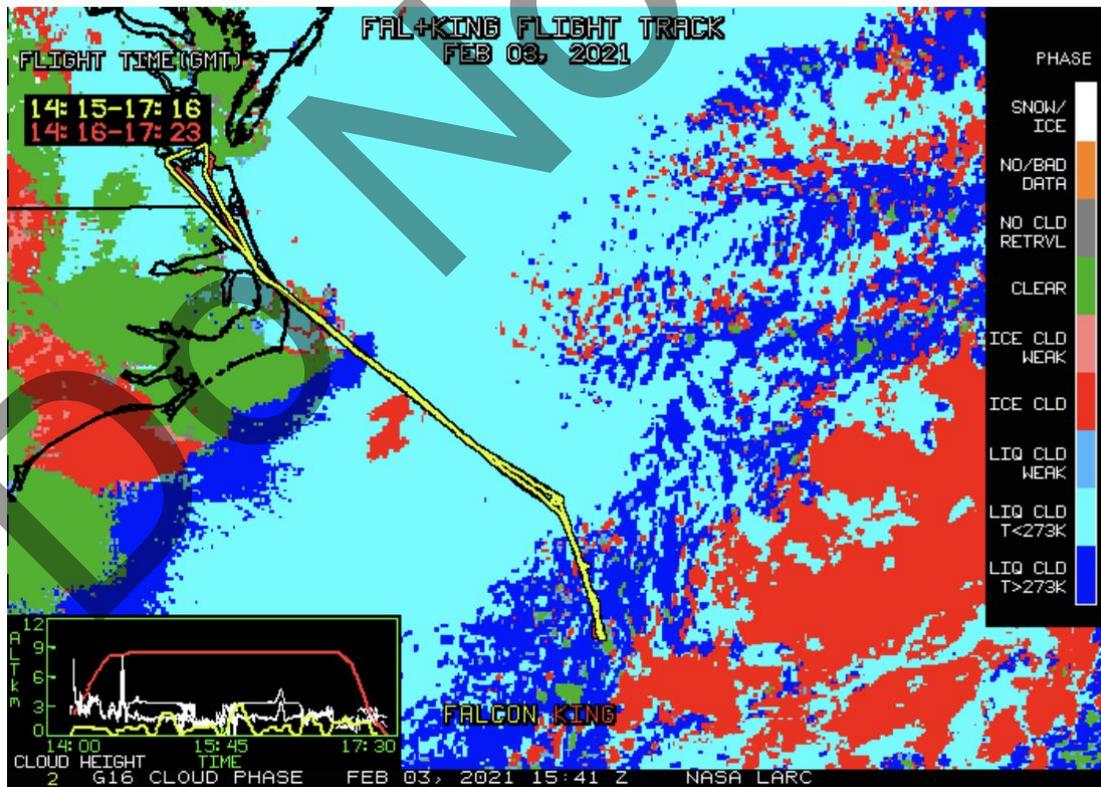
Encountered mixed phase clouds with columns where the closed cells are, which quickly showed a transition to rimed particles. While passing the open cells near the turning point pure liquid clouds were observed.



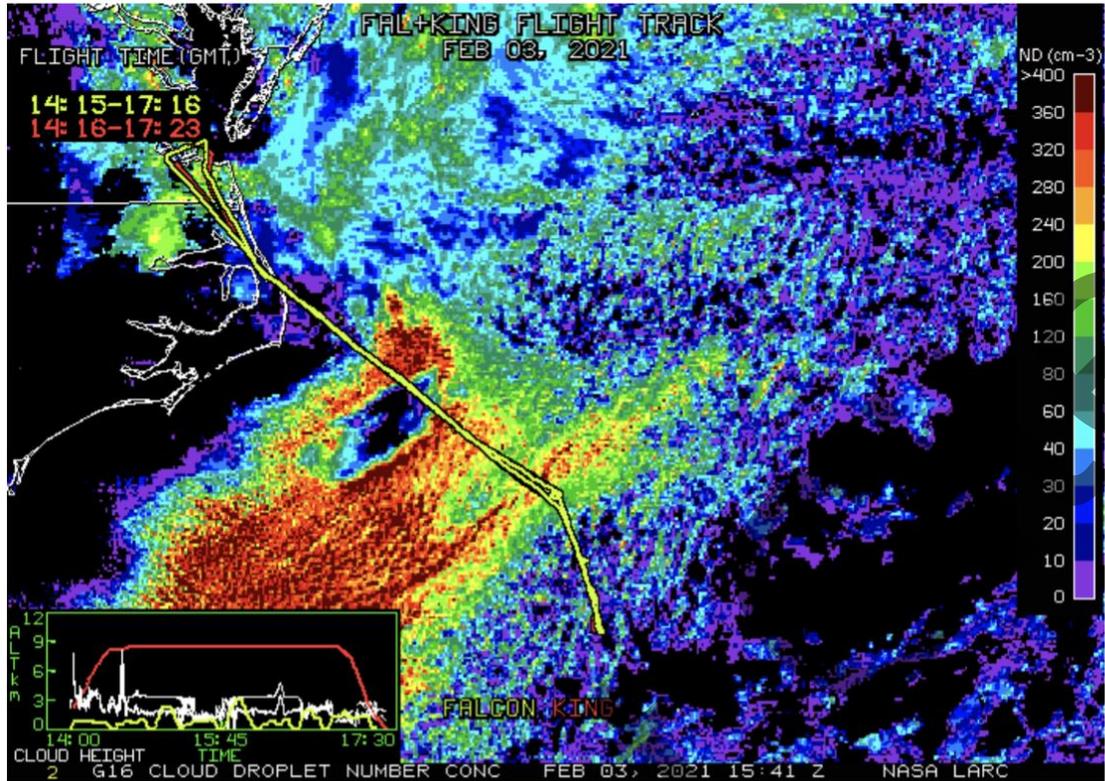
NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 44, 15:41 UTC Feb 03, 2021
Visible Image



Cloud Phase



Cloud Droplet Number Concentration (cm-3)



Cloud-Top Height (Kft-ASL)

